

January 10, 1997

Mr. Lawrence Pollex, Director
City of Perth Amboy
Department of Municipal Utilities
260 High Street
Perth Amboy, New Jersey 08861

**RE: Review of Performance Monitoring Program (PMP)
Quarterly Report No. 23
Madison Industries
Old Bridge, New Jersey
November 26, 1996**

Dear Mr. Pollex:

Killam Associates recently received and reviewed the above referenced report. This report summarizes the results of the groundwater monitoring performed by Madison Industries (MI) on a quarterly basis. The report also includes data on the recovery system currently operating at the MI site. Based upon our review of this report, we wish to offer the following comments.

The report indicates that recovery well RW-3 was shut off in May of 1993 in favor of an increased pumping rate at recovery well RW-6. As stated in the Final Phase II Remedial Investigation Report by MI, dated September 27, 1996, the water table in the area of RW-3 seasonally rebounds causing contaminated groundwater to discharge directly into Pricketts Brook. The New Jersey Department of Environmental Protection (NJDEP) should require MI to return RW-3 to operational status in an effort to alleviate this discharge into the Brook.

The report indicates that copper was detected in well DW-9S, which is located upgradient of supply well PA-6, at a level which exceeds the Ground Water Quality Criteria. MI states that, "The source of this elevated copper concentration is unknown". A review of Figure 4 of this report shows that copper was not detected in any of the shallow wells sampled in the area of DW-9S; however, a review of Figure 12 shows that there are a number of wells (specifically MW-P5, WFH-1 and WFH-2) located upgradient and cross-gradient to DW-9S which were not sampled. It is quite possible that elevated levels of copper are also present in these wells, and that the source of the copper is upgradient of well DW-9S, in the vicinity of the MI site.

MI states that the groundwater contour maps generated for this report do not include water level elevation data for "active recovery wells, production wells operated by Perth Amboy, or groundwater recovery and pumping activities conducted by CPS". This information should be included as much as possible in the groundwater contour maps for the following reasons: (1) The effective drawdown from the recovery system should be taken into consideration in



determining groundwater flow direction since pumping of the aquifer produces a change in static groundwater conditions; (2) MI should take all pumping effects into account when preparing a plan for their shallow point groundwater recovery system; and, (3) A more thorough groundwater contour map would be beneficial to determining contaminant migration within the aquifer.

Madison states that, "The recovery wells continue to provide hydraulic control of groundwater at and in the vicinity of the Madison site.". A review of Figure 12, Groundwater Elevation Contour Map - Shallow Wells, shows an "estimated RW-2 capture zone" in the area between the DW-8 and DW-10 well clusters. Recovery well RW-2, was placed in operation on January 25, 1991, approximately six years ago. A review of the analytical results for shallow wells located downgradient of this "estimated RW-2 capture zone" reveals the presence of cadmium, copper, lead and zinc at levels which exceed the Ground Water Quality Criteria for these analytes. Based on these factors, the "estimated RW-2 capture zone" shown on Figure 12 is inaccurate. A review of Figure 13, Groundwater Elevation Contour Map - Deep Wells, shows estimated capture zones for RW-2 and RW-4. A review of the analytical results for deep wells located downgradient of both these "estimated capture zones", indicates that cadmium, copper, lead and zinc are present in these downgradient wells at levels which exceed the Ground Water Quality Criteria for these analytes. Therefore, the estimated zones of capture for RW-2 and RW-4 are incorrect. Additionally, if the shallow and deep recovery wells were providing effective hydraulic control, then elevated levels of cadmium, copper, lead and zinc would not be detected in the wells downgradient of these recovery wells.

MI's report indicates that they have "evaluated the previous ten PMPs and the current groundwater monitoring system". Based on these evaluations, they have determined that "the groundwater monitoring system is both aerially and statistically adequate to monitor levels of metals on the CPS/Madison sites and the Perth Amboy watershed". MI should discuss any statistical methods they may have employed to perform this "evaluation". Madison further states that the current recovery systems provide hydraulic control of the groundwater in the vicinity of the Madison site. There is a great difference between achieving drawdown versus an effective hydraulic control of groundwater contamination. Clearly, as long as contaminated groundwater continues to discharge into Pricketts Brook in the area of RW-3, MI has not achieved effective hydraulic control of the groundwater contamination. Additionally, due to the presence of Pricketts Brook, which acts as a migratory pathway, through the center of the MI site, Madison must not only achieve hydraulic control in the "vicinity of the site", they must achieve hydraulic control onsite!

MI describes the location of four surface water samples. A review of the figures included in the report indicates that only surface water sampling locations SW-3 and SW-4 are shown. MI should also include surface water sampling locations SW-1 and SW-2 on a map.



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Re-commencement of pumping at RW-3 should be initiated immediately to prevent the discharge of contaminated groundwater into Pricketts Brook. MI should also review their estimated zones of capture for RW-2 and RW-4, as analytical results from downgradient wells indicate that the contaminant plume is not being captured or controlled.

If you have any questions regarding the above comments, please do not hesitate to contact me.

Very truly yours,

KILLAM ASSOCIATES

A handwritten signature in cursive script, appearing to read 'Fletcher N. Platt, Jr.'.

Fletcher N. Platt, Jr. P.E.

cc: Leah Healey, Esq.
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